Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☐ Responsive to communication(s) filed on _____ .

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-15</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1-15</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____ .

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

    DOV POPOVICI
    SUPERVISORY PATENT EXAMINER
    TECHNOLOGY CENTER 2100

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>3</u> .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> (e) the invention was described in-
> (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
> (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

2. Claims 1-3 are rejected under 35 U.S.C. 102(e) as being anticipated by <u>Vahalia et al</u> (U.S.

Patent No. 6,192,408.)

As to claim 1, <u>Vahalia et al</u> teaches a method of searching a file access system for a

requested file (see Abstract, and see column 19, line 66 through column 20, line 17),

comprising:

allocating memory for directory cache and buffer cache (see column 21, lines 36-45), the

directory cache storing directory layouts (see column 21, lines 5-11, where "storing directory

layouts" is read on "a filename in the directory of the cache");

searching the directory cache for a requested file (see column 19, line 66 through column

20, line 17); and

pointing to where the name of the requested file is stored (see column 18, lines 8-14,

where "the name of the requested file" is read on "file ID".)

As to claim 2, <u>Vahalia et al</u> teaches the method further comprising conventionally

searching file structures when the directory cache is not found (see column 29, lines 32-40,

where "directory cache is not found" is read on "with the cached disk storage system

omitted".)

As to claim 3, <u>Vahalia et al</u> teaches wherein the step of allocating memory for directory

cache includes selecting directories to cache using at least one of the number of files in a

directory and the frequency of use (see column 7, lines 41-67.)

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 4-5, and 14-15 are rejected under 35 U.S.C. 102(b) as being anticipated by <u>Saks et al</u>

(U.S. Patent No. 5,666,532.)

As to claim 4, <u>Saks et al</u> teaches a method of accessing files in a file access system (see

Abstract, and see column 5, lines 2-6), comprising:

reading a directory into buffer cache, the directory having a storage device representation

(see column 7, lines 38-46, and see column 9, lines 13-30, where "storage device

representation" is read on "disk");

converting the directory from the storage device representation to a faster representation

(see column 9, lines 13-30, where "faster representation" is read on "keeping file data and

file system structural information in the page cache **41**, or the buffer cache **40**, or both the

caches"), the faster representation representing a layout of the directory (see column 7, lines

41-45); and

searching the faster representation for a requested file (see column 8, lines 20-23);

wherein the storage device representation is maintained for backwards compatibility with

pre-existing and older file access systems (it is inherent that files kept on disks, CDs, or other

type of storage device representation are kept for the purpose of maintaining compatibility

with pre-existing and older file access systems.)

As to claim 5, Saks et al teaches a method of accessing files in a file access system (see

Abstract, and see column 5, lines 2-6), comprising:

reading a directory into buffer cache, the directory having a storage device representation

(see column 7, lines 38-46, and see column 9, lines 13-30, where "storage device

representation" is read on "disk");

converting the directory to a faster representation, the faster representation (see column 9,

lines 13-30, where "faster representation" is read on "keeping file data and file system

structural information in the page cache **41**, or the buffer cache **40**, or both the caches")

including a pointer from a directory i-node to an associated hash table (see column 10, lines

54-56), the hash table containing a layout of the directory (see column 20, lines 60-64, and

see figure 7); and

searching the faster representation for a requested file (see column 8, lines 20-23);

wherein the storage device representation is maintained for backwards compatibility with

pre-existing file access systems (it is inherent that files kept on disks, CDs, or other type of

storage device representation are kept for the purpose of maintaining compatibility with pre-

existing file access systems.)

As to claim 14, Saks et al teaches a computer server system (see column 30, lines 30-41),

comprising:

an outer cabinet housing memory, an array of storage devices, at least one power supply

providing electrical power to the computer server system (see computer system 3 of figure

19. It is inherent that a "server system" has "an outer cabinet housing memory, an array of

storage devices, at least one power supply providing electrical power to the computer server

system", and

at least one processor (see column 30, lines 33-34.)

For the remaining steps of claim 14, applicant is directed to the remarks and discussions

made in claim 5 above.

As to claim 15, Saks et al teaches a network storage system (see column 6, line 65

through column 7, line 7, and see column 30, line 29, where "network storage system" is read

on "network file system", and see figure 19), comprising:

an outer cabinet housing memory, an array of storage devices, at least one power supply

providing electrical power to the network storage system (see column 30, lines 52-56. It is

inherent that a "network storage system" has "an outer cabinet housing memory, an array of

storage devices, at least one power supply providing electrical power to the network storage

system"), and

at least one processor (see column 30, lines 33-34.)

For the remaining steps of claim 14, applicant is directed to the remarks and discussions

made in claim 5 above.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness

rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

6. Claims 6-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saks et al (U.S.

patent No. 5,666,532), as applied to claims 4-5 above, in view of Ish et al (U.S. patent No.

5,778,430.)

As to claim 6, Saks et al does not teach the method further comprising hashing selected

directories into a hash table format.

Ish et al teaches a method and apparatus for computer disk cache management (see

Abstract), in which he teaches hashing selected directories into a hash table format (see

column 5, lines 41-44.)

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Saks et al to include hashing selected directories into a hash table format.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Saks et al by the teaching of Ish et al, because hashing selected directories into a hash table format, would make the management of hashed data blocks easier and more efficient.

As to claim 7, Saks et al does not teach the method further comprising hashing selected directories into a hash table format according to a size of the directory.

Ish et al teaches a method and apparatus for computer disk cache management (see Abstract), in which he teaches hashing selected directories into a hash table format (see column 5, lines 41-44) according to a size of the directory (see column 5, lines 61-65.)

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Saks et al to include hashing selected directories into a hash table format according to a size of the directory.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Saks et al by the teaching of Ish et al, because hashing selected directories into a hash table format according to a size of the directory, would tailor the management of hashed data blocks to accommodate directories with different sized of data.

As to claim 8, <u>Saks et al</u> does not teach the method further comprising hashing selected directories into a hash table format according to frequency of access.

<u>Ish et al</u> teaches a method and apparatus for computer disk cache management (see Abstract), in which he teaches hashing selected directories into a hash table format (see column 5, lines 41-44) according to frequency of access (see column 6, lines 7-13.)

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified <u>Saks et al</u> to include hashing selected directories into a hash table format according to frequency of access.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified <u>Saks et al</u> by the teaching of <u>Ish et al</u>, because hashing selected directories into a hash table format according to frequency of access, would tailor the management of hashed data blocks to accommodate directories based on how frequently they are accessed.

As to claim 9, <u>Saks et al</u> does not teach the method further comprising hashing selected directories into a hash table format according to a user selected criteria.

<u>Ish et al</u> teaches a method and apparatus for computer disk cache management (see Abstract), in which he teaches hashing selected directories into a hash table format (see column 5, lines 41-44) according to a user selected criteria (see column 5, lines 37-40, and see column 8, lines 28-37.)

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Saks et al to include hashing selected directories into a hash table format according to a user selected criteria.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Saks et al by the teaching of Ish et al, because hashing selected directories into a hash table format according to a user selected criteria, would tailor the management of hashed data blocks to accommodate directories based on a pre-defined set of parameters submitted by the user.

As to claim 10, Saks et al teaches a method of searching a file access system for a requested file (see column 8, lines 20-23), comprising:

establishing a pointer for the directory, the pointer pointing from a directory i-node (see column 10, lines 54-56) to the hash table (see column 10, lines 54-56.)

Saks et al does not teach:

allocating a hash table, the hash table having hash buckets;

hashing a directory into the hash table; and

searching the hash buckets for a requested file.

Ish et al teaches a method and apparatus for computer disk cache management (see Abstract), in which he teaches: allocating a hash table, the hash table having hash buckets (see column 5, line 66 through column 6, line 6); hashing a directory into the hash table (see column 5, lines 43-50); and searching the hash buckets for a requested file (see column 3, lines 53-63.)

Therefore, it would have been obvious to a person having ordinary skill in the art at the

time the invention was made to have modified Saks et al to include allocating a hash table,

the hash table having hash buckets; hashing a directory into the hash table; and searching the

hash buckets for a requested file.

It would have been obvious to a person having ordinary skill in the art at the time the

invention was made to have modified Saks et al by the teachings of Ish et al, because

allocating a hash table, the hash table having hash buckets; hashing a directory into the hash

table; and searching the hash buckets for a requested file, would increase the speed of

managing (indexing, retrieval) of cached data within different directories.

As to claim 11, Saks et al as modified teaches wherein the step of hashing a directory

includes hashing selected directories into a hash table format (see Ish et al, column 5, lines

41-44) according to a size of the directory (see Ish et al, column 5, lines 61-65.)

As to claim 12, Saks et al as modified teaches wherein the step of hashing a directory

includes hashing selected directories into a hash table format (see Ish et al, column 5, lines

41-44) according to frequency of access (see Ish et al, column 6, lines 7-13.)

As to claim 13, Saks et al as modified teaches the method further comprising linking hash

buckets to offsets where a name of the requested file is stored (see Ish et al, column 3, lines

47-53.)

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure.

The following patents are cited to further show the state of art with respect to searching

and retrieval of files from file access systems and directories, and performing Hash functions

on directory contents in general.

U.S. Patent No. 6,453,319 to <u>Mattis et al</u>.

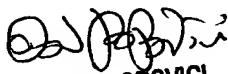U.S. Patent No. 6,314,437 to <u>Starek et al</u>.

U.S. Patent No. 5,151,989 to <u>Johnson et al</u>.

8. Any inquiries concerning this communication or earlier communications from the examiner

should be directed to Tony Mahmoudi whose telephone number is (703) 305-4887. The

examiner can normally be reached on Mondays-Fridays from 08:00 am to 04:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Dov Popovici, can be reached at (703) 305-3830.

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January 27, 2003